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April 21, 1951

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Sam Wutcher

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A SCIENCE SERVICE PUBLICATION

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NEUROLOGY

Search for Brain Damage

Damage to brain from infectious diseases may cause behavior problems in children, neurologists' meeting told. Report chemical aids multiple sclerosis victims.

► **SEARCH FOR** brain damage due to some infectious disease in children with behavior problems, Dr. Arthur R. Timme of Los Angeles advised physicians at the meeting of the American Academy of Neurology in Virginia Beach, Va.

Brain damage is particularly to be suspected in children who are restless and do not pay attention, or who seem to be half asleep instead of paying attention, and in children who fly into rages over trifles.

The part of the brain involved in learning to concentrate and pay attention and in learning to control anger when we cannot have our own way is the part likely to be damaged by infectious diseases, Dr. Timme pointed out.

Behavior disorders have long been known to follow attacks of encephalitis, sometimes called sleeping sickness. But when the encephalitis is mild or when it has been a complication of some other disease, such as measles, it may have been overlooked altogether, or may not be suspected as the cause of behavior difficulties appearing some time later.

With proper diagnosis, medicines and training, such children can be helped to overcome their behavior difficulties, Dr. Timme said.

The medicines he suggests are phenobarbital and whole pituitary gland substance. Small doses of phenobarbital given over a long period seem to lessen the readiness to fly in a rage when thwarted. The pituitary preparation seems to enhance the effect of the phenobarbital, perhaps by stimulating circulation in the whole pituitary region of the brain.

When parents, teachers and doctor look on the annoying behavior as a symptom of a sick child rather than the misdeeds of a naughty child, there is an important psychological effect which helps in training the child.

Evidence that the medicines also help, however, comes from relapses seen during control periods when the medicines are withheld.

Multiple Sclerosis Help

► **A CHEMICAL** that overcomes spasms of the blood vessels is helping some patients with the disabling nerve disease, multiple sclerosis, three Cleveland physicians reported at the meeting.

The physicians are Drs. Guy H. Williams, Jr., L. J. Karnosh and Howard J. Tucker of the Cleveland Clinic.

Tetraethylammonium chloride is the name of the chemical, they reported. It has been used previously for patients with high blood pressure.

"Under no circumstances," the doctors stated, "do we consider tetraethylammonium chloride to be specific in the treatment of multiple sclerosis."

At most, they explained, it appears to be only a palliative treatment, giving relief but not cure, particularly in the acute phase of the disease. Only moderate to no improvement can be hoped for in the chronic stage. It is possible, they reported, that when given in the early stage of a bout of the disease, the chemical may prevent formation of new "scars" in the central nervous system.

In spite of their very cautious view of the drug, they reported that in some cases "startling changes" were seen within one or two days after giving the chemical.

One "very notable case" was that of a 20-year-old girl who had paralysis of the legs. Within one to two hours after her first dose of the chemical, she could move her legs, which she had not been able to do for several weeks before.

Other patients have reported strange skin sensations, such as prickling or burning or crawling feelings, were less intense, or that visual disturbances such as seeing double improved or that muscular coordination in the hands was better after two or three injections.

Use of the chemical depends on the theory that some of the trouble in multiple sclerosis is a disorder of blood vessels, either a spasm of the vessels or a change in the tone of the blood vessel walls. The cause of the disease, however, is still unknown.

Brain Fat Dangerous

► **A UNIQUE** but fairly frequent brain disease, often mistaken for other conditions, is the sudden plugging of a blood vessel in the brain by fat.

It is important in blast injuries, "concussion," air casualties and battle injuries as well as in accidents in civilian life, Dr. A. Silverstein of Philadelphia reported at the meeting.

"In our present atomic age it becomes a very timely subject for research," he declared.

Jarring of the skeleton accompanied by multiple bruises is the type of injury most likely to cause the condition. Such injuries apparently change the normal emulsified fat into globules big enough to plug blood vessels, Dr. Silverstein explained.

Following the first step of injury with or without shock, the patient may pass through the following phases: 1. lucid intervals varying from hours to days; 2. sudden start of lung symptoms with fever, rapid pulse and difficult breathing; 3. brain symptoms of stupor, delirium and confusion which may occur without the lung involvement; 4. various neurologic signs such as convulsions and muscular rigidity. Finding free fat in the urine or sputum and many small hemorrhages over the upper chest and the linings of nose, throat and eyes may help in diagnosing the condition.

The medicolegal as well as military significance of the condition make it important, Dr. Silverstein stressed, for doctors to be on the alert for it.

The problem also, he said, "presents an ideal opportunity for research in the human being relating to the important problem of cerebral anoxia." This is the state of oxygen lack in the brain, cause of "black-outs" in airplane pilots and important in other conditions also.

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CHEMISTRY

Concentrated Liquid Ozone Proposed as Rocket Fuel

► **CONCENTRATED LIQUID** ozone was proposed as a rocket fuel at the meeting of the Electrochemical Society in Washington, D. C., by Prof. Clark E. Thorp of the Illinois Institute of Technology. He reported on advances made at the Institute by which ozone can be handled with safety.

Ozone is a form of oxygen with three atoms to the molecule instead of two as in ordinary life-supporting oxygen. Ozone, except in very dilute quantities, is dangerous to human life but it is used in safe quantities in water purification, air-conditioning and as a bleaching agent.

By demonstrating that ozone can be safely manufactured, Prof. Thorp stated, the door has been opened for tonnage production. During World War II, German scientists worked overtime on an ozone-propelled rocket designed to bombard New York City from European launching platforms. But they were unable to discover the secret of handling ozone without spontaneous detonation.

By replacing oxygen tanks with containers of liquid ozone, both planes and submarines would gain additional space with no sacrifice in oxygen volume, he stated. Oxygen containing ozone gives off more usable oxygen per unit of volume.

Ozone is made by bombarding oxygen with high speed electrons. At the Institute laboratory, "We used to have about one unscheduled explosion a day until we learned that ozone could be made to behave by removing certain thermal, mechanical, electrical and chemical sensitizing influences," he stated.

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ANTHROPOLOGY

Oldest American Bones

Forgotten bones of Natchez man called oldest American, 11,000 years old. Were resting forgotten in museum collection.

See Front Cover

► A HUMAN pelvic bone that has rested obscurely in the collections of the Philadelphia Academy of Natural Sciences for well over half a century promises to be recognized belatedly as the oldest human remains on the American continent.

This human bone unearthed at Natchez, Miss., is about 11,000 years old, contemporaneous with the *Mylodon* giant sloth which was known to have existed in late Pleistocene (Ice Age) time but which became extinct then.

Dr. T. D. Stewart, U. S. National Museum anthropologist, has reviewed evidence for man's antiquity as measured by the fluorine content of bones. In 1895 Thomas Wilson, then curator of the National Museum in Washington, applied fluorine analysis to the bones of Natchez man. The famous chemist Dr. W. F. Hildebrand found the human bone was more fossilized than those of the sloth bones found with it.

A great controversy raged. The leading geologist of that day, Leidy, gave much publicity to Natchez man. But finally Natchez man and his antiquity was virtually forgotten. He rested undisturbed in the Academy of Natural Sciences, last being exhibited 15 to 20 years ago.

Within the past year the possibility of using the fluorine content of bones to determine their relative age has had renewed investigation. New datings for human remains in Texas, England and elsewhere are being made.

Dr. Stewart, as a result, reviewed the old results and in a communication to the journal, *SCIENCE* (April 6), points out the probable age of Natchez man.

In response to a *SCIENCE SERVICE* inquiry, Dr. H. Radcliffe Roberts, director of the Academy of Natural Sciences, located the Natchez pelvis in his collections. An inch hole in the bone could be seen, showing that samples of it had been furnished for the fluorine test of the 1890's. Records show it was discovered by Dr. N. W. Dickeson, a local physician.

As a result Natchez man will go back on exhibit in the Academy's halls.

Unlike the dating by means of radiocarbon isotope content, which is the atomic age method, fluorine dating depends upon determining contemporaneity and relative antiquity. It can be applied to bones, whereas radiocarbon methods apply only to materials that contain carbon, such as charcoal.

As bones remain buried and exposed to ground water, one of the substances in the

bone, called hydroxyapatite, traps the fluorine ions in the water to form, by ionic exchange, fluorapatite. This is a material that is more stable and resistant to weathering. When two bones come from the same location, one of them human of unknown age and the other from an animal whose age is relatively certain due to its species becoming extinct, they can be matched for age by analysis of the fluorine contents.

This was done years ago for Natchez man and the sloth bones found with him. The fluorine contents matched. The old evidence, like the bones themselves, has now been dusted off and given a prominent place in our knowledge of early man.

Fluorine which is now being added to our water supplies to build better teeth for the population, is recognized today as a chemical that adds also to knowledge of the human past.

Dr. Horace G. Richards, associate cu-

rator of geology and paleontology for the Academy, points out in the picture on the cover of this week's *SCIENCE NEWS LETTER* the region where the bone was found.

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CHEMISTRY

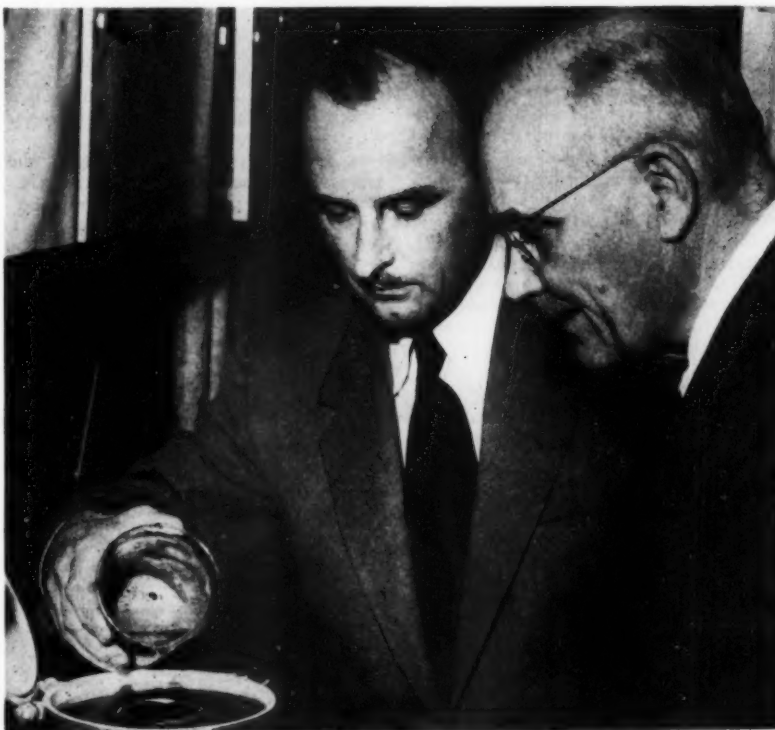
Lignin Shows Promise as Chemical Raw Material

► ONE of the two major constituents of wood, lignin, promises to become as valuable as the other material, cellulose or wood pulp, now widely used in industry.

Two University of Washington scientists have developed a new process for separating the lignin from the other parts of the wood and converting it into complex material that can be used as an adhesive, a plastic and a source of organic chemicals.

Triethylene glycol is used as a solvent in the method developed by Bror Grondal, forestry professor and Piotr Zenczak, research assistant. Acid and alkali solutions are now used to separate out the lignin, which is a troublesome waste material of pulp mills. Instead of being dumped into streams and rivers to cause pollution, or being burned to get rid of it, lignin complexes will become valuable chemical raw material.

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LIGNIN EXTRACTION—Piotr Zenczak and Prof. Bror Grondal, who have developed a new method for processing wood pulp, preparing pulp for lignin extraction.

PSYCHOLOGY

Illiterates More NP Risk

► WHILE CONGRESS wrestled with the problem of draft deferment for college students, Navy-supported research showed a problem at the other end of the educational scale.

This is the relation between illiteracy and neuropsychiatric disorders.

As a group, illiterates are a greater neuropsychiatric risk than literates, Comdr. William A. Hunt, MSC, U. S. N. R., and Comdr. Cecil L. Wittson, MC, U. S. N. R., find. Their study was made of records of over 1,400 illiterate recruits arriving at a naval installation for literacy training during the last war.

"Of every group of 100 illiterates inducted for military service," they report, "about 15 will be given neuropsychiatric discharges before their literacy-training program is completed and three more will be neuropsychiatric casualties by the end of the first year of service."

"It is impossible to unravel the actual cost of this high neuropsychiatric rate to the Government," the two officers state. "The cost is high, but whether or not it is compensated for by the service rendered by the 82 still surviving after one year is an open question."

If the manpower situation becomes so acute that illiterates must again be inducted into the armed forces, Commanders Hunt and Wittson suggest that intensive psychiatric service for both diagnosis and treatment should be provided, as well as training or attempts at training in reading and writing.

Being illiterate, or unable to read and write, is not just a matter of never having gone to school and learned reading and writing, they point out. Illiteracy is often a symptom of some underlying personality difficulty which perhaps made the man unable as a child to learn to read and write.

On the other hand, the handicap of illiteracy may contribute to the development of personality disorders.

Mental deficiency, personality disorder, psychoneurosis, schizophrenia, epilepsy and constitutional psychopathic state were among the diagnoses given illiterates discharged for neuropsychiatric reasons in the group studied.

The research, carried on at Northwestern University, Evanston, Ill., is reported in the U. S. ARMED FORCES MEDICAL JOURNAL (March).

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BACTERIOLOGY

Antidote to Ultraviolet, Daylight, Is Cancer Hope

► ORDINARY DAYLIGHT provides an antidote to ultraviolet ray death. That is the case at least for cells such as bacteria and molds and may be true for cells of the human body.

Dr. Albert Kelner, Harvard University bacteriologist, found that recovery of cells given the visible light treatment after usually fatal doses of ultraviolet rays was so complete that he feels there is being studied "the key factor in the mechanism causing death by ultraviolet radiation."

Visible light not only prevents death of the cell but probably also reduces the number of mutations, or permanent changes in heredity, which are also caused by short-wave ultraviolet radiation.

If, as Dr. Kelner's work suggests, the killing and mutation-inducing effects of ultraviolet can be reversed or prevented, perhaps the cancer-inducing effect of short-wave ultraviolet radiation can also be reversed or prevented. The answer to this must come from future research.

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Question Box

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ZOOLOGY

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University of Washington; p. 245, Philadelphia Zoological Garden; p. 247, Westinghouse Research Laboratories; p. 250, Southwest Research Institute.

RADIO

Saturday, April 28, 1951, 3:15-3:30 p.m. EST
"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Walter C. Alvarez, professor of medicine for the Mayo Foundation at the University of Minnesota, and author of the book "How To Live With Your Nerves," will discuss "The Little Strokes."

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PHYSICS

Hint New Dosimeter

Study of magnetic color centers in common salt and other alkali halides may lead to useful method of measuring radioactive dosage.

► A MAGNETIC study of color centers in chemicals such as common salt is being conducted at Oregon State College, Corvallis, by Dr. Allen B. Scott, associate professor of chemistry, under an Office of Naval Research grant.

Color centers are formed when vacant spots in an alkali halide compound which lack a negative charge pick up electrons either when illuminated by X-rays or when heated in sodium vapors, Dr. Scott said. Temperatures up to 1,000 degrees Fahrenheit are necessary for the heat treatment.

The wandering electrons settle down in the vacant places and impart a color to the compound, depending upon the length of exposure to light and heat the alkali halide receives. An alkali halide is a chemical combination of sodium or potassium with either of the four halides—fluorine, bromine, iodine or chlorine.

The colors, which are imparted and make the salt crystals slightly magnetic, include shades of yellow, blue, violet and pink, depending on the particular alkali halide used. Before exposure the salts are colorless.

Magnetic forces on the crystals as small as one billionth of an ounce have been measured, Dr. Scott reported. Equipment

developed by the Oregon State College chemistry department is used to measure these infinitesimal forces.

Interest in this research has developed because the colors are also produced by radioactive particles and the intensity of color tells how strongly exposed the crystals have been to harmful radiation. The method may be useful to measure radioactive dosage.

This color formation is closely related to many processes common to photography and television. It was found that these migrating electrons—knocked loose in the crystal by the X-rays—make the crystals photo conducting, Dr. Scott said. They are similar to the silver salts used in photographic plates.

Dr. Scott's work has recently been reported in detail in several scientific journals, including the PHYSICAL REVIEW and the JOURNAL OF CHEMICAL PHYSICS.

Students who have worked on this program are Dr. L. P. Bupp, now at Hanford, Wash., H. J. Hrostowski, now at the University of California; and Dr. K. H. Sweeny, now at Aerojet Engineering Corp., Pasadena. William A. Smith and Floyd Theisen, graduate students, are currently working on the research.

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METALLURGY

Brazil's High Grade Ores

► BRAZIL, as well as Russia, has large deposits of high-grade iron and manganese ores, the two minerals essential in steel production, the U. S. Geological Survey reported recently. These deposits are important to the United States, particularly the manganese because America now imports about 90% of this ore, without which steel cannot be produced by present known commercial processes.

The Soviet Union is the only other nation known to have an ample domestic supply of both iron and manganese ore. America has enough high-grade iron ore to last another generation or so, and has plenty of the magnetic taconite that can be used in iron production. It has considerable supplies of manganese, but it is of low grade, and this country now imports some 1,500,000 tons of manganese a year.

The report on Brazil's reserves of manganese in the Serra do Navio district was based on field work to determine Brazil's resources in both iron and manganese. The

survey extended over the past ten years as a cooperative project of geologists of both countries. The report is available from the U. S. Government Printing Office for 45 cents. It is Geological Survey Bulletin 964-A.

While an accurate appraisal of the overall tonnage of Brazil's resources in these minerals cannot yet be made, it has been determined that the country contains the two largest deposits of high-grade manganese known in the Western Hemisphere. Rich deposits of high-grade iron ore have also been found.

Brazil is already supplying America with some manganese, but the amount is small. Mexico, Cuba and Brazil together supply about 20% of the present manganese used here. India, the Union of South Africa and the African Gold Coast contribute about 70% of the tonnage needed. Prior to World War II, America's great source of manganese was Russia.

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BLACK LEOPARD—This leopard is merely a black variation of the ordinary spotted form, and close inspection would reveal the presence of spots. Known as melanism, the black condition is caused by an overabundance of dark pigment. Jezebel now resides in the recently opened Carnivora House of the Philadelphia Zoo.

BIOLOGY

Wheat Rust Less Dangerous Than Experts Had Feared

► NATURE'S BIOLOGICAL warfare in the form of the new invasion of stem rust fungus will not take heavy toll of America's wheat crop this year if early indications are correct.

The race 15B stem rust that caused an epidemic in durum wheat in Minnesota and North Dakota last year has evidently been held in check by drought in the southern regions of the country. Experts feared that the rust would survive the winter there and thus be ready to be blown back north. The new invasion is not prevalent markedly in Mexico which is a potential reservoir of the disease.

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CHEMISTRY

Predict One Drop of Blood For Full Chemical Analysis

► SOME TIME in the future one drop of blood will be enough for a complete chemical analysis on which life-saving diagnosis of illness can be made, Dr. Albert E. Sobel of the Jewish Hospital of Brooklyn, N. Y., predicted at the meeting of the American Chemical Society in Boston.

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GENERAL SCIENCE

Science Fairs Aid Nation

► **NATIONAL SECURITY** Resources Board Chairman Stuart Symington praised the local and National Science Fairs as helping to keep America's lead in science and technology.

The Second Annual National Science Fair, sponsored jointly by Science Service and local newspapers, will be held in St. Louis, May 10-12. High school boys and girls from all over the country, who were winners in local fairs, will participate.

"Scientific and technical know-how," Chairman Symington said, "have made this Nation a leader among nations, and will keep it so. Newspapers and educators aware of the critical shortage of scientific personnel, are striking at the roots of the problem in a cooperative effort to encourage scientific interests at the student level through such media as science fairs."

"With this sort of watchful leadership America will never be caught technically unprepared."

Other national leaders have spoken of the critical shortage of scientific, technical and engineering personnel needed to keep the nation ahead of communism, a shortage which the science fairs are designed to help overcome.

Students from ten states and the District of Columbia will arrive in St. Louis May 10 to set up their scientific exhibits. The

GENERAL SCIENCE

Draft Boards Have Option

► **THE TEMPEST** in a teapot about the college deferment system is about over. Two immovable facts which opponents of the system had not understood quieted the storm. They were brought out in an executive session of the House Armed Services Committee.

Fact number one is that the new deferment system was not mandatory on the local boards—could not be under the present draft law. The resolution introduced by Rep. Paul Kilday, D-Tex., merely reaffirms this fact, really does not change anything.

Fact number two is that the new system actually will put into the army more college boys than are going under present regulations. Now, all college boys are deferred. Next year, a good percentage will not be able to escape the draft.

There was a third issue, having nothing to do with draft facts or regulations, which really folded the opposition within the House Armed Services Committee to the college deferment plan. Members learned that small colleges—important in many of their districts—would get as fair a break as the big colleges like Harvard and the Massachusetts Institute of Technology.

Thus, Harvard President James Conant's

exhibits will be judged by a panel of outstanding scientists and awards of scientific equipment and books worth \$1,000 will be made to the outstanding students. Each national contestant will receive a Gold and Silver Finalist Medal.

In all cases, the students won the right to make the trip to the National Science Fair at local fairs in their own communities and states. There they competed with their classmates and neighbors.

In St. Louis, Washington University will be the site of the Fair. In addition to displaying and explaining their exhibits, they will meet and talk with outstanding scientists and tour the city and its research laboratories.

The sponsoring newspapers, responsible with high school teachers and Science Service for both the local and National Science Fairs, are:

The Hartford (Conn.) Times, The Washington Daily News, The Evansville (Ind.) Press, The St. Louis Star-Times, The Knickerbocker (Albany, N. Y.) News, The Ononta (N. Y.) Star, The Grand Forks (N. D.) Herald, The Archbold (O.) Buckeye, The Oklahoma City Times, The Allentown (Pa.) Call-Chronicle Newspapers, The Philadelphia Inquirer, The Providence (R. I.) Journal-Bulletin and The Martinsville (Va.) Bulletin.

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opposition to a plan of college deferment boomeranged. The Congressmen reasoned—fairly or unfairly—that Dr. Conant was for military service and training for everybody because he knew Harvard would not suffer and he did not care about the little colleges.

The life of many little colleges depends on some system of college deferment. The Congressmen were sensitive to this.

Therefore, the House Armed Services Committee, while reaffirming the right of local draft boards to have the final say, dropped its opposition to the college draft plan.

U. S. Commissioner of Education Earl McGrath said that a total of less than 300,000 would be affected by the new plan.

There are 1,059,000 full-time, undergraduate males between the ages of 18 and 26 in the nation's colleges. Of these, 689,000 are either veterans, Four-F's or in the R.O.T.C. Of the remaining 370,000 who are draft eligible, somewhere between 70,000 and 150,000 are not yet 19—present draft age limit.

Under the new college draft regulations, a percentage of these will not be able to meet deferment requirements and will be drafted. Therefore, those deferred to go to

college next year will not total more than 204,000.

An objection to the plan is that boys unable to afford to go to college would not be able to take advantage of the plan. Commissioner of Education McGrath, in releasing the correct figures, also called for immediate inauguration of a federal scholarship-fellowship plan to take care of this. He said this would be more in keeping with democratic principles.

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BIOLOGY

Devise Way to Estimate Next Fall's Pheasants Now

► **BETTER REGULATION** of the pheasant-hunting season, and possibly longer periods for shooting the game birds, may result from a method devised for estimating the spring hatch of the ring-necked pheasant.

The number of pheasants varies from one hunting season to another, as hunters know. One reason for this may be that the number of eggs laid by the female pheasants varies from year to year and from place to place.

By killing and examining a half dozen or so hens, biologists can get a good estimate of the number of pheasants to be hatched in any one year.

The studies were made by Prof. Roland K. Meyer of the University of Wisconsin, Madison, Cyril Kabat of the Wisconsin conservation department and Irven O. Buss of the State College of Washington, Pullman.

In southern Wisconsin and places of similar climate, pheasants begin to lay April 3 to 13 and the peak of the first layings occur April 18 to 28.

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INVENTION

High Quality Dry Ice Obtained From Natural Gas

► **HIGH-QUALITY** dry ice, relatively pure solid carbon dioxide, is obtained from raw natural gas containing gaseous to heavy crude oil hydrocarbons by a process on which the government issued a patent. The product is colorless, odorless, tasteless, and non-toxic, so is suitable for use in the refrigeration of foods.

In the process, well fluid of a petroleum well is separated into a gas cut of substantially fixed gases and methane, an ethane cut, and cuts of heavier products. The gases are burned with substantially pure oxygen to form carbon dioxide. The ethane is used to purify the carbon dioxide.

Inventors are Robert P. Russell and Walter H. Rupp, Mountainside, N. J. Patent 2,548,498 was awarded them. Rights to the patent have been assigned to Standard Oil Development Company.

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TECHNOLOGY

Perfect Vacuum Bottle To Store Liquid Helium

► A MUCH improved vacuum bottle, working on the same principle as the kind taken on picnics but used by scientists when making investigations near absolute zero, was described at a Low Temperature Symposium, Washington, D. C. Absolute zero is more than 459 degrees below zero Fahrenheit. Studies at such extremely cold temperatures give more knowledge of the atom.

Dr. Aaron Wexler, of the Westinghouse Research Laboratories, Pittsburgh, stated that the bottle can hold liquid helium 15 times longer than the best container previously available. Dr. Wexler perfected the container in collaboration with Howard S. Jacket, of Hofman Laboratories, Inc., Newark, N. J.

The new vacuum bottle will hold four gallons of liquid helium for 100 days, about 15 times longer than containers now in use. It will give a longer lasting supply of the super-cold liquid, where previously scientists often had to make their own liquid helium.

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ENTOMOLOGY

If DDT Does Not Kill Flies, Try Non-Chlorinated Chemicals

► WHEN DDT begins to fail in a job of fly eradicating in a community because the flies have developed resistance to it, better change to a non-chlorinated insecticide, such as parathion, sabadilla, pyrethrum, nicotine or TEPP.

This seems to be the practical suggestion from research by Drs. Richard Weiner and James F. Crow of the University of Wisconsin, Madison.

Fruit flies were used in their studies because these can be reared in large numbers in the laboratory and because more precise information on the genetics of the problem can be obtained with them than with other insects.

Fine crystals of DDT were scattered in the fly cages in gradually increasing amounts. At the end of a year, only about 5% were killed by a concentration that killed about 95% of the control flies that had not previously been exposed to DDT.

Descendants of these flies were tested with 10 other insecticides at the age of four days. About four times the DDT concentration was required for the resistant strain of flies as for the susceptible strain from which it was derived.

Of the 10 other insecticides tested, compounds that are chlorinated, as DDT is, were less effective than the non-chlorinated ones. Chlorinated compounds tested were: DDD, lindane, 118 or "Aldrin," toxophene and methoxychlor.

Details of the studies are reported in the journal, SCIENCE (April 13).

Science News Letter, April 21, 1951

CHEMISTRY

Phosphors Convert Better

► CHEMICAL PREPARATIONS known as phosphors, which convert invisible ultraviolet and cathode radiation to visible light, are now available in improved forms, the Electrochemical Society meeting in Washington, D. C., was told. These phosphors are important in fluorescent lamps and in television.

A new phosphor containing barium pyrophosphate and titanium dioxide was described by two British scientists, S. T. Henderson and P. W. Ranby, Thorn Electrical Industries, Limited, of London. Its luminescent properties are similar in many respects to those of magnesium tungstate, for which it is a useful substitute in fluorescent lamps. It has short afterglow, high efficiency, and good maintenance in the mercury discharge, they declared.

The important part played by arsenic in a zinc sulfide phosphor was revealed by Jerome S. Prener of the General Electric Research Laboratory, Schenectady, N. Y. The addition of small amounts of arsenic to zinc sulfide produces a phosphor which has three emission bands when excited by ultraviolet or cathode rays.

The relative intensity of the various bands depends upon the concentration of the arsenic, the atmosphere within which the phosphor is fired, the mode of excitation and the temperature during excitation. By a proper adjustment of the arsenic concentration, it is possible to produce phosphors which emit white light.

Direct excitation of phosphors by electric field was discussed by Elmer C. Payne, Eric L. Mager and Charles W. Jerome, all of Sylvania Electric Products, Inc., Salem, Mass. Electrical energy is converted directly into light by the action of a fluctuating electric field upon a suitable solid, they stated.

This solid is called a luminophor. It is embedded in a dielectric. Light output increases with the potential and frequency of the applied field, and with the dielectric constant of the dielectric. The light emitted is sufficiently intense for practical use and a number of applications have been developed. Phosphors play an important part in the night vision goggles used by soldiers in Korea to pick off enemies prowling in the dark.

Science News Letter, April 21, 1951



SUPER VACUUM BOTTLE—Keeping the world's coldest liquid is the job of this new vacuum bottle designed by Dr. Aaron Wexler of Westinghouse Research Laboratories. He is lifting the "bottle" from a bath of liquid nitrogen.

RADIO

Harnessed Musical Pitch Controls Gyroscope Speed

► THE MUSICAL pitch of A above middle C is being harnessed to control the speed of gyroscopes, vital instruments for ships and bombing planes.

The perfect note, broadcast 24 hours a day by the National Bureau of Standards in Washington, is being picked up via short wave radio by engineers at the Minneapolis-Honeywell Regulator Company, Minneapolis. The standard musical pitch is used because the engineers require exactly 400 cycles of electrical current every second and they need an accuracy of one part in 100,000.

WVW, the Bureau's short wave radio station, makes time broadcasts that are accurate within two one-hundred millionths of a second. The station's signal is used to check a tiny electronic tuning fork, which is just about as precise as the government's A above middle C. The fork is then hitched to an amplifier which, in turn, supplies power to run the gyroscope. This set-up is checked against an electronic timer, a stop watch that measures time down to four one-hundredths of a second.

Science News Letter, April 21, 1951

METALLURGY

Tungsten Allocated as Essential Defense Metal

► THE IMPORTANCE of tungsten in making equipment for the armed services is emphasized by government orders just issued putting allocation controls on tungsten ores and concentrates. Domestic production of this important metal is far below requirements, and in an emergency foreign supplies might become unavailable.

Two former sources of tungsten for America, China and Korea, are now reported closed. Chinese tungsten is now going to the Soviets, it is reported, and Korean mining activities are suffering from the war. China before Red control supplied over one-fourth of the tungsten imported into the United States.

Bolivia and Brazil are heavy producers of tungsten, and do their part in meeting American needs. Spain is also a heavy producer, and the United States gets considerable tungsten from Spain and a lesser quantity from Portugal. Additional supplies come from Siam and the Belgian Congo, with relatively small quantities coming from a dozen other countries including Argentina, Mexico and Canada.

Tungsten has the highest melting point of all the metals, which explains its importance where heat-resistant materials are required. An important application is in electric lamp bulbs as a filament. The modern tungsten filament lamp uses about one-third as much wattage as the old carbon filaments to give the same illumination.

Tungsten with iron or steel produces alloys of great hardness and tensile strength. High-speed cutting tools may contain up to some 20% of tungsten and they can be worked on a lathe until red hot without losing the necessary hardness. There are many other applications of tungsten, including in electrical and electronic products.

Other strategic metals may go under government allocation control in June, it is announced by the Defense Minerals Administration, whose head is Dr. James Boyd, director of the U. S. Bureau of Mines. The list includes chromium, cobalt, columbium, calcium, boron, manganese, molybdenum, nickel, silicon, tantalum, titanium, vanadium and zirconium. An important use of many of these minerals is in alloys to produce special steels.

Science News Letter, April 21, 1951

MEDICINE

Rh Blood Factor Studies Win Award for Two Doctors

► DR. PHILIP Levine of the Ortho Research Foundation of Raritan, N. J., and Dr. Alexander S. Wiener of Brooklyn, N. Y., have been selected as joint and equal recipients of the \$5,000 Passano Foundation Award for 1951.

The work of Drs. Levine and Wiener relates to the discovery and clinical application of the Rhesus (Rh) factors in human blood. It has had profound and wide effects on medical practice in obstetrics and pediatrics.

Starting with the fundamental work of the late Dr. Karl Landsteiner, who in 1930 was awarded the Nobel Prize in Medicine primarily for his discovery of human blood groups, O, A, B, and AB which made possible the relatively safe transfusion of blood, work was carried forward with both Drs. Levine and Wiener collaborating at one time or another with Dr. Landsteiner, but not with each other although each was in touch with the other's work.

Science News Letter, April 21, 1951

BIOLOGY

Color and Odor Draw Bees To Flowers of Springtime

► BOTH the color and the perfume of the year's first, newly opened flowers draw honeybees, Dr. C. G. Butler, entomologist at the Rothamsted Experimental Station at Harpenden, Eng., has found.

Color is the chief factor which attracts a scouting honeybee to a flower, though a really strong perfume can act in the same way.

Once the honeybee has been attracted toward a flower crop, even the weak perfume of the individual flower persuades the honeybee to enter it. If the perfume of the individual flower is masked, the bee hesitates to enter it on a first or subsequent visit.

Science News Letter, April 21, 1951

IN SCIENCE

MEDICINE

Ersatz Food Chemical Stops 'Flu Virus in Embryo

► SCIENTISTS MAY be on the track of a way to stop influenza by starving the virus so it cannot propagate itself.

While still far from providing a cure for influenza in humans, the method has succeeded in stopping virus propagation in embryonated chicken eggs where it normally grows well.

The method was discovered by Dr. W. W. Ackermann of the University of Michigan School of Public Health, Ann Arbor, Mich. It consists in feeding the virus in the chick embryo a substitute chemical for the protein-building amino acid, methionine. The substitute chemical, methoxinine, is enough like methionine so that the virus cells take it up readily. But the methoxinine cannot do the nourishing job of methionine and blocks the latter from its job.

The same stopping of 'flu virus propagation can be accomplished by another chemical, ethionine.

The chemicals do not, however, destroy the virus or the tissue it is growing on nor do they prevent the virus from infecting the embryo cells.

Details of Dr. Ackermann's work are reported in the JOURNAL OF EXPERIMENTAL MEDICINE (April).

Science News Letter, April 21, 1951

HORTICULTURE

Chemical Spray Makes Sagebrush "Bite Dust"

► WHEN IT becomes a nuisance on Western ranches, sagebrush is being eliminated by 2,4-D spray, according to the University of California Agricultural Extension Service, Davis, Calif.

Reports from California farm advisers indicate that purple sage, California sage, and coyote brush have been killed by spraying with 2,4-D, applied either by ground rigs or by airplanes or helicopters.

Best results have occurred when the plants treated have large areas of active new leaves.

Spraying brush has proved profitable only when the soil is good enough to grow feed. Cost of material and spraying by helicopter has been \$5 per acre or more in most tests.

A permit to use 2,4-D and 2,4,5-T must be obtained from agricultural commissioners if more than five pounds of acid equivalent are used. Care must be taken to avoid drift of the material to sensitive crops such as tomatoes, grapes and beans.

Science News Letter, April 21, 1951

SCIENCE FIELDS

PSYCHOLOGY

Scaring People Not Best Way to Change Their Habits

➤ SCARING PEOPLE is not the best way to make them change their habits. It may even interfere with their developing new attitudes.

This was discovered in an experiment by Drs. Seymour Feshbach and Irving L. Janis, of Yale University, New Haven, Conn., and reported to the Eastern Psychological Association, Brooklyn, N. Y.

A 15-minute lecture on dental hygiene was prepared in three different ways, all of which proposed the same recommendations. The first was planned to rouse anxiety by showing graphically diseased gums and painful tooth decay resulting from neglect. The other two forms presented moderate and minimal anxiety appeals.

The moderate anxiety-arousing lecture was the best for actually getting people to brush their teeth, it was found.

But when people are worried, that interferes with their forming new attitudes, the findings showed.

Science News Letter, April 21, 1951

BOTANY

Ancestor of Red Tomato Wild and White from Peru

➤ THE ANCESTOR of the bright red tomato, the housewife's choice, may have been a white fruit species that grew in South America.

So say Dr. J. A. Jenkins, associate professor of genetics, and Dr. G. Mackinney, professor of food technology, at the University of California's College of Agriculture, Berkeley.

A report by these two scientists points out that certain wild species of tomatoes, native to Peru, have fruits entirely lacking in pigments. The fruit assumes an off-white color as it ripens.

It is possible that the ancestral form of today's cultivated tomato was similarly white, in which case the common red fruit must have appeared as a mutant, or offspring, with a different characteristic maintained in subsequent generations. At any rate, it is known that the red-fruited form has produced two such mutants, the yellow and tangerine.

Colors of tomatoes, the University of California scientists say, are due to certain complex mixtures of carotenoid pigments, which derive their name from the characteristic pigments of the carrot. Among them is carotene, the most important natural source of vitamin A.

The red and tangerine tomatoes contain several carotenoid pigments, but the yellow fruits are low in carotenoid content.

Most California tomatoes have yellowish skins, which tend to give the red-fleshed tomato a slightly different color from those obtained in markets during the height of winter. These winter tomatoes, which come from Mexico, have colorless skins, so the identifiable color is the true color of the inside flesh.

Experimental cross breeding of the three colors of tomatoes by Drs. Jenkins and Mackinney brought interesting results.

In two of the crosses—red with tangerine, and red with yellow—the first generation hybrids are red, but the parental types recur in the second generation.

The third cross—tangerine with yellow—also has a red first generation offspring. But in the second generation, rather than returning simply to tangerine and yellow hybrids, red offspring also appear.

Science News Letter, April 21, 1951

INVENTION

Ordinary Electric Razor Can Be Used To Cut Hair

➤ THE ORDINARY electric razor can be used to cut the hair, as well as shave the face, provided it is equipped with an attachment on which the government recently granted a patent, 2,547,288.

It is a three-sided rectangular piece, pivotally attached to the razor, and its lower side is a plate with comb teeth. This plate when pressed against the skull holds the cutting blade of the razor a proper distance away while the comb teeth hold the hair upright for clipping. The pivotal movement raises or lowers the cutting blade to regulate the length of the hair.

Inventor is Bernhart P. Sandlie, Malta, Mont. No alterations in the razor are needed to use this device.

Science News Letter, April 21, 1951

MEDICINE

Radio Broadcasts Interfere With Blood Pressure Studies

➤ COMMERCIAL radio broadcasts temporarily have interfered with a search for the cause of high blood pressure, the council for high blood pressure research of the American Heart Association was told at its meeting in Cleveland.

Drs. Harold C. Wiggers and John J. Farrell of Albany, N. Y., Medical School had developed a method of using radio waves to stimulate the nerves going to the kidney and other areas of the body. The idea was to see whether long-continued stimulation of these nerves would cause high blood pressure.

Local commercial broadcasts interfered with their stimulating wave signals, so the research has had to be stopped until a shielded room is built.

Science News Letter, April 21, 1951

BIOLOGY

New Amino Acid Is Found In Protein of Body

➤ A NEW biological material, hitherto unknown in nature, has been added to the two dozen amino acids known to make up the protein of body tissues. Dr. H. R. Crumpler, Dr. C. E. Dent, Dr. H. Harris and R. G. Westall, working at the Medical Unit, University College, London, have isolated this unique substance from the urine of certain families of normal, healthy humans.

Kidneys of both men and women in groups of related individuals apparently make and secrete amino-iso-butyric acid throughout the lifetime of these otherwise normal people, without regard to age, sex, diet or any other factor which might be expected to modify body chemistry.

The new substance is a modification of a similar substance, amino-butyric acid previously reported in 1912 but not confirmed. Both substances have been made synthetically and are well understood from the theoretical viewpoint. The remarkable circumstance is their appearance in only a few related strains of the human family. Chromatography, a new method of chemical detection, is responsible for the discovery of these individuals and their unusual chemical output.

Further study at the University Hospital is in progress, which may throw more light on the part this unexpected chemical may play in building up body chemicals in processes of nutrition and growth. The studies are reported in NATURE (Feb 24).

Science News Letter, April 21, 1951

TECHNOLOGY

Southern Industry Increase Outstrips National Rate

➤ THE 16 STATES constituting the area below the Mason and Dixon line, including Texas, are now doing nearly 60% of all American textile manufacturing, 75% of tobacco manufacturing, producing 40% of the petroleum-coal products and over 33% of the products of the chemical industry.

These figures were given to the American Society of Mechanical Engineers meeting in Atlanta, Ga., by Prof. Frank F. Groseclose of the Georgia Institute of Technology. The South is booming, he said, and may now be considered the nation's number one region of opportunity.

In the past decade the value of manufactured products in the South increased 248% as compared with 232% for the nation as a whole. This is only a beginning of what the South can do with the labor, natural resources, markets and power facilities at its command. The natural resources include not only farm products such as cotton and sugar, but also lumber, petroleum, natural gas, sulfur, iron, coal and other minerals.

Science News Letter, April 21, 1951

BIOLOGY

Proxy Mothers Is Science's Aim

In animal world now, mothers bear offspring not really their own. Applied to humans new methods promise babies for childless women.

By WATSON DAVIS

► IT IS getting so that in the animal world a mother can not be sure that a baby is really her own. And an offspring of a cow or a rabbit or a dog can never be sure that its mother really is its mother, biologically speaking.

So far as fathers are concerned, animal babies, those of the best cows at least, can never hope to see papa, and they are often not even born in the same state or the same country. For proxy papas are the rule for the best-bred cows. Calves are progeny of parents who never see each other.

Providing the male for a herd of cows by mail order is relatively old stuff. This artificial insemination of cows allows the dairyman or cattle-raiser to dispense with the trouble, cost and danger of keeping a bull on the premises. One out of ten of America's cows are serviced through breeding associations using only about 2,000 high-caliber bulls, or one bull to some 1,300 cows.

Combined with the selection and cross-breeding that has been possible through the application of the scientific principles of heredity, the improvement of farm animals has been greater in the past couple of decades than it had been in all the centuries since men have been farmers.

Not content with multiplying the potentialities of a superior bull, the animal breeders are now looking with interest and anticipation to a method making scrub or just ordinary cows give birth to superior-bred calves on the mother's side as well as the father's side of its lineage.

One Calf Produced

One such calf has been produced. It was quite an event in animal husbandry. A calf still microscopic in size was transplanted from one cow to another and there allowed to grow until the substitute mother calved. A heifer was born, weight 84 pounds, with markings and blood factors that the foster mother could not have given.

This happened at the University of Wisconsin. It was the culmination of much previous work, for as long as 16 years ago this transfer of a fertilized egg from one animal to another had been accomplished in rabbits and it has since been done with mice, rats and sheep.

Dr. Gregory Pincus of the Worcester Foundation for Experimental Biology is the pioneer in this method, since he transferred artificially inseminated eggs from one female rabbit to a foster mother which did the work of giving birth to these bunnies not her own. These rabbit eggs are not

the sort depicted on Easter cards, of course, but they are actual mammalian eggs, extremely small. As is the usual way with mammals, these ova develop within the animal and the little ones arrive ready to take up their own existence.

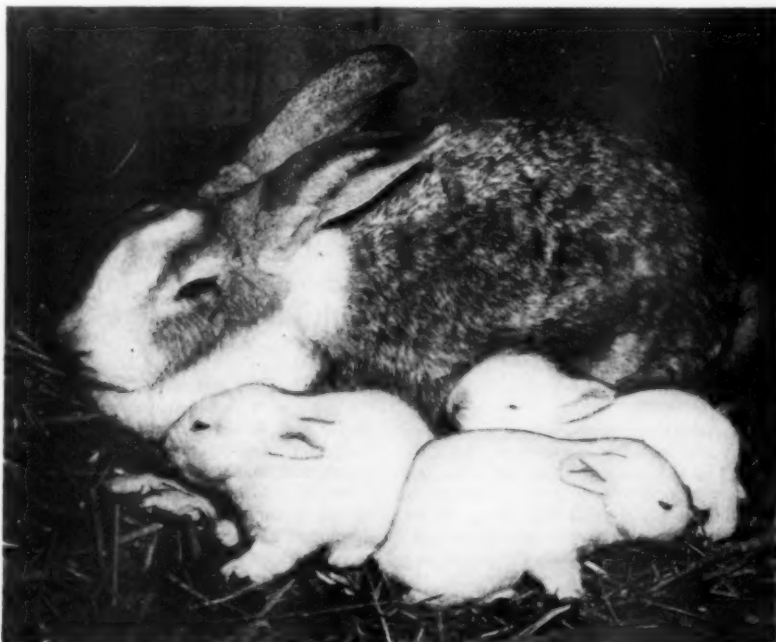
Applying this method to animals as large and as valuable as cows was something else. The economic returns are inviting, because a cow can produce only about one calf a year and this takes her out of production for a good part of that time. But if the ova of a blue-blooded cow could be transferred to wombs of less valuable or even scrub cows, a superior cow might have as many as 20 calves a year without actually going through the long process of pregnancy herself.

Two serious attempts have been made to give this ova transplanting a serious trial in cows. Success came first to the University of Wisconsin research joined in by the U. S. Department of Agriculture's Bureau of Dairy Industry and the American Foundation for the Study of Genetics in which

there is participation by the American Breeders Service, largest cattle artificial insemination organization.

In Texas there is also an extensive application of ova transplantation to cows by the Southwest Research Institute founded by Texas oil man Tom Slick, Jr. Working with cattle of both the beef and dairy types, the cattle ova transplantation is under the supervision of Dr. M. C. Chang, a young Chinese scientist on leave from the Worcester Foundation for Experimental Biology, who has specialized upon mammalian eggs and their transplantation. This program until recently was in charge of Raymond E. Umbaugh, who worked on this problem even when a pilot in World War II.

With cows it is not nearly so simple, as it is with rabbits. The rewards for a successful method are larger but the bigger animal is harder to handle and the failures are more costly. Nature arranges it so that a cow produces only one ovum each 35 days and it is difficult to find and extract. The scientists get around this by injecting pituitary extract that brings about super-ovulation with something like 25 ova produced at the same time. But these eggs are seemingly not so strong as ordinary ones. The calves produced too often die before birth.



BIOLOGICAL IMPOSSIBILITY?—This gray rabbit actually gave birth to these three white albino young. Ova transplantation made her a mother by proxy. Fertilized eggs taken from an albino doe were transferred to the Dutch pattern gray rabbit.

There is potentially a revolution for stock breeders in the making, although the experts warn that the cattle ova transplantation work is a long way from practical application just now. The farmer is going to benefit from the egg transfer method of birth by what the geneticists learn about fertility and other biological factors in applying it experimentally.

Transplant Ovaries Also

Why be content with transferring mere eggs from mother to proxy mother? Transplantation of the whole female sex organ, the ovaries, has been accomplished in the dog, with the result that one breed of dog can become the proxy mother of puppies unrelated to her. Dr. Leon F. Whitney, a geneticist-veterinarian of Orange, Conn., has done this. There are interesting possibilities in this technique, aside from the question of how to register the pure-blooded puppies whelped by a foster mother.

Working with Dr. Harry S. N. Greene of Yale, Dr. Whitney found that worn-out ovaries of older dogs were actually rejuvenated when transplanted to a young dog. A champion dog might have puppies by this method years after she herself is dead.

Applied to human beings, this ovary transplantation suggests that a young woman could give a new vigor and span of usefulness to an old woman's sex organs and give birth to the older woman's children.

Less radical would be the application to human beings of the egg transplantation method. Women who cannot have children because they are infertile might undergo ova transplantation and experience a foster motherhood in this way. Or women who want children of their own heredity and desire to dodge the burden of childbearing and birth could arrange to have some willing female receive and nurture her hereditary progeny. The process would be more complex scientifically and practically than the artificial insemination that is now used among humans under medical supervision.

But this is only natural. The female is more complex than the male so far as reproduction is concerned. Biologically, the woman has more hereditary burdens than the male of the species.

Science News Letter, April 21, 1951

MILITARY SCIENCE

Sniperscope Spots Enemy

► AMERICAN SOLDIERS in Korea are seeing prowling enemies in the darkness of night with the same device with which they saw prowling Japanese during the latter part of the war in the Pacific. It is the so-called sniperscope, a rifle attachment which reveals the prowlers by invisible infra-red radiation.

The sniperscope being used in night-fighting in Korea today is an improved type, details of which are not revealed. But the Army has disclosed that it is now standard equipment for infantry divisions in Korea and that it is in quantity production. It operates, however, on the same general principles as the older models.

The night-fighter using the sniperscope carries a six-volt battery and vibrator on his back which powers the device. On the gun is a tube in which infra-red radiations are generated and beamed to the front in the direction in which the rifle is pointed. These infra-red, or heat rays, are reflected back from an object encountered just as ordinary light rays are returned, making the object visible.

The returning infra-red rays are invisible, but they are picked up by a telescope on the barrel of the weapon and passed into a tube in which the invisible image made is converted into one that is visible. When the infra-red rays strike the image tube, electrons are released which are in direct proportion to the intensity of the rays. These electrons pass to a fluorescent screen, producing a visible image.

A version of the sniperscope called a snooperscope was used during World War II attached to helmets of soldiers or to trucks to enable drivers to detect obstacles in the path ahead. It was also used to detect enemy tanks and other war equipment at night. The Nazis had a detection device of the same sort. It was called a "heat-eye tube," and was used in trucks and tanks but never refined, as far as is known, for use as a rifle or helmet attachment for use of the foot soldier.

Science News Letter, April 21, 1951

INVENTIONS

Patented Device May Oust Honeybee as Pollen Carrier

► THE HONEYBEE may lose its job in carrying pollen from one blossom to another in the fruit orchard, replaced by a man-operated device which can spray pollen gathered from a selected tree to the blossoms on others.

To use the device, the operator does not need to climb the tree being pollinated. The sprayer is at the end of a pole, so that pollen can be distributed without leaving the ground. A blast of air, either from a manually-operated bulb or from a compression tank, dispenses the pollen from a container on the tubular device. Inventors are Ira A. Marchant and Edwin P. Johnson, Oroville, Wash., and the patent is 2,548,487.

Science News Letter, April 21, 1951

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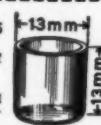
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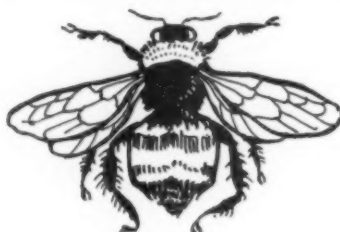
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The Bumblebee's Sleep

► A LITTLE later in emerging from winter quarters than their smaller kindred, the bumblebees should be in evidence by now. Why bumblebees fare forth later than their semi-domestic cousins, the honey-bees, cannot be stated definitely. It may be because the bumblebee's best food plants have not yet developed their flowers, or it may be simply because the big insect, being a ground-dweller, is not warmed up as early as the hive-inhabiting honey-bees.

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The bumblebee is a semi-solitary insect to begin with. New colonies are founded by solitary females that fly away from the parent hive in autumn. The female bees then proceed to dig themselves in, though winter is still remote. They sleep in their little burrows more than half-way round the calendar. While the weather is still warm, they do not sink into the deep and death-like slumber of true hibernation from which they are now emerging. After the first frost, however, the female bumblebees remain profoundly unconscious until spring warmth arouses them. This deep sleep of hibernation is quite probably a matter of physical economy, for the bee must depend on the food stored in her own body tissues, plus a gorged crop from a last drink at the honey pots of the home nest.

About now, the bee fares forth to find some nectar on which to feed, then proceeds to hunt a new homesite—frequently in an abandoned burrow of some other animal or a natural crack. There she digs out a chamber more commodious than her winter bedroom, and on the floor of this sets up waxen household pots, which she stocks with food. Unlike the honey-bee queen, she is, at this stage of her existence, very much a worker; the honey-bee queen is simply a maternal mechanism, and cannot work at all—can scarcely even feed herself.

Having got the nucleus of a home started, the bumblebee queen lays her first few eggs, and when the hungry little grubs hatch from them she becomes an even more zealous worker than before. Only when she has this first small squad of workers brought up and ready to go forth and seek the community bread and honey does she retire like a lady, and thenceforth devote herself strictly to the business of being an ancestor.

At one time it was thought that only bumblebees could pollinate red clover. Scientists have now found, however, that this is not the case. Although the honey-bee does not have the equipment to get at red clover's nectar, when gathering pollen it serves as an effective means of pollinating this crop. And a good thing, too, for the giant bumblebee grows more scarce each year.

Science News Letter, April 21, 1951

TECHNOLOGY

Alcohol-Water Shots Pep Up Auto Engines

► AUTO ENGINES are pepped up by a shot of alcohol mixed with water.

When warmed up engines are laboring under heavy loads, 75 octane fuel can be made to do the work of 90 octane gasoline by the alcohol-water injections reported to the American Chemical Society meeting in Cleveland by J. C. Porter and Richard Wiebe of the U. S. Department of Agriculture's Northern Regional Research Laboratory.

Science News Letter, April 21, 1951

INVENTION

Kapitza Receives Patent For Liquid Oxygen Method

► PETER Leonidovitch Kapitza has been awarded American patent 2,548,377 for a method and means for producing liquid oxygen or liquid air rich in oxygen. It is a process for obtaining oxygen from the air by the separation of the nitrogen and oxygen of which the atmosphere is mainly composed.

The invention utilizes low pressures of from five to ten atmospheres and turbine expansion engines, which create the very low temperature required to liquefy part of the air passing through the apparatus. The method is particularly advantageous because of the use of a highly efficient type of turbine expansion engine. The cost of producing oxygen by it is claimed much reduced as compared with costs by other known methods.

Science News Letter, April 21, 1951

ENGINEERING

Geysers Yield Electricity For Italian Industry

► ANCIENT GEYSERS near Florence, Italy, known to man for 2,000 years, are producing electricity for Italian industry again after the restoration of plants destroyed by retreating Germans in 1944.

Most of the power comes from drilled wells, not from natural geysers, Giuseppe Donata of Ercole Marelli and Company told the American Society of Mechanical Engineers meeting, Atlanta, Ga. Before World War II, some 140 wells had been drilled. Now new wells are being drilled, and with new turbogenerators just completed the kilowatt output is double that of prewar days.

These plants generate electricity from what seem to be inexhaustible torrents of natural steam from deep in the earth. The flow of steam is constant, providing continuous reliable power. The steam has a temperature of from 290 to 400 degrees Fahrenheit, and a pressure between 71 and 390 pounds per square inch.

Science News Letter, April 21, 1951

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NUTRITION

Unusual Foods Aid Hunger

► **WORLD HUNGER**, which breeds revolution and unrest, could be conquered if unusual foods, some of them considered weeds, were more appreciated and utilized in the undeveloped countries, Prof Robert S. Harris of the Massachusetts Institute of Technology told the American Academy of Arts and Sciences in Boston.

Telling of his analysis of more than 1,500 unusual food plants in Mexico, Central America and China, Dr. Harris explained that some peoples in the Mexican desert are well fed because they eat native plants we would spurn but which experience has taught them can provide the essentials of good diet as well as meat, milk and eggs which we consider necessary. Iron, calcium and needed vitamins can be obtained from what we consider weeds.

For instance, malva is a Mexican weed related to hollyhocks which would be promising material upon which plant breeders could work since it is a staple of Mexican Indians. Similarly a kind of laurel and a legume, called chipilin, are used as food successfully in Mexico.

Dr. Harris questioned the wisdom of introducing peoples of other areas to our surplus foods such as dried skim milk if their economy will not allow them to produce such foods upon a permanent basis. It would be preferable, Dr. Harris said, to make available food suitable to their own production. When imported emergency foods are stopped as they eventually must be, agitators antagonistic to the United States may charge that we are deserting the people that we have been helping, whereas if we devoted our en-

ergies to improving their own kinds of foods the gains made would be permanent.

Sweet potato leaves are another food that is used widely in Central America, Dr. Harris found. Good foods of this sort could be added to our diet and Americans could benefit from eating things that we have forgotten about or never knew could be eaten.

Science News Letter, April 21, 1951

ZOOLOGY

Geese Weed Strawberries: They Like Grass Better

► **YOU CAN** weed your strawberry patch with geese, but you will have to learn the technique of doing it.

So say experts of the University of California Agricultural Extension Service, Davis, Calif., who describe the method and some of its pitfalls.

In the first place, a limited number of individuals have geese. Those who do, need to fence their strawberry beds to keep the geese in the field, and should work out a system of keeping geese moving back and forth across the strawberry bed. Putting their feed at one end of the strawberry plot and their water at another helps in doing this.

The value of the geese lies in their selective grazing. They like the grass but do not care for the strawberry plants. When the fruit is ripening, the geese need to be taken from the field.

The University of California experts report that geese are of most value the first year that the plants are set out and of reduced help when the plants become dense and matted.

Science News Letter, April 21, 1951

A "Btu," unit of *heat* measurement, is about the amount of heat delivered by burning a wood safety match all the way down.

MEDICINE

Peppery Drug Benefits

► **A NEW** synthetic chemical with a faintly peppery taste is helping patients with the muscle weakness disease, myasthenia gravis, five Chicago doctors report in the *JOURNAL of the AMERICAN MEDICAL ASSOCIATION* (March 31). The five are Drs. J. Alfred Rider, Sidney Schulman, Richard B. Richter, Hugo Moeller and Kenneth DuBois.

The chemical is octamethyl pyrophosphoramide, or OMPA for short. It is related to DFP and other of the nerve war gas and insecticide group of chemicals developed during World War II and tried as treatment for myasthenia gravis. Because of a different chemical structure, OMPA keeps better and is less toxic than chemicals of the DFP group.

OMPA succeeded in controlling the muscle weakness symptoms in four of the first six patients to whom it was given. These four patients preferred it to neostigmine, standard drug for myasthenia gravis, because OMPA has a smoother, more sustained action. When they took the drug

every 12 hours, their strength stayed at an even level throughout the day and night, instead of reaching a peak after a single dose and then dropping off.

Three patients had more strength than when taking neostigmine, and the fourth had at least as much. Cramps, diarrhea and profuse sweating were the only unpleasant symptoms and these were controlled by atropine or belladonna.

The two patients who were not helped by OMPA were victims of very severe myasthenia gravis who were not being much helped by neostigmine. From these results it appears the new drug will be useful only in mild and moderately severe cases.

Science News Letter, April 21, 1951

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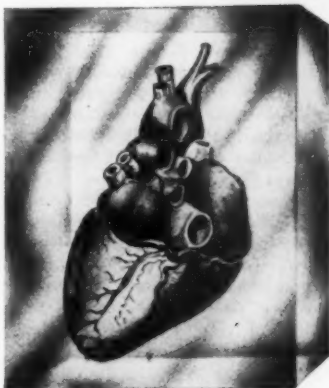
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MEDICINE

Foresee Spleen Banks

► **SPLEEN BANKS**, supplied by spleens removed from babies dying soon after birth, may in future join blood, bone, nerve and eye banks for medical use.

The spleen banks, if they can be established, will be for victims of atomic attack whose lives might be saved by transplant of a baby spleen into their bodies.

This prospect, though far from practical reality now, is suggested by research at the University of Chicago. Dr. Leon Jacobson, assistant dean of medicine there, has found he can save 50% of adult mice if, after killing doses of X-rays, he opens their bellies and drops into each belly the spleens from four baby mice.

With two spleens, 45% of the mice can be saved, but with only one extra spleen, only 4.2% of the mice can be saved.

Previously Dr. Jacobson showed that lead shielding of the spleen during X-irradiation would save 77% of mice. Preventing damage to the spleen, important site of blood formation in the body, could theoretically save many human atomic bomb victims. Wearing lead vests on the chance of an atomic attack is obviously not a practical method of defense. Spleen

banks for saving surviving victims appear somewhat more practical.

Dr. Jacobson's latest findings were announced by the American Cancer Society which supports his research in the hope of finding ways to increase X-ray doses for destroying cancers without harming the patients.

Science News Letter, April 21, 1951

CHEMISTRY

Seek Fireproof Lubricants For High Temperature Jets

► **LUBRICATING OILS** that are more fireproof at the higher temperatures of jet plane engines are being sought by University of Cincinnati chemists cooperating with the National Advisory Committee for Aeronautics.

One discovery is that the metals used may by catalytic effect lower by as much as 200 degrees the temperature at which special new lubricants will burst into flame.

Dr. Charles E. Frank reported to the American Chemical Society meeting in Cleveland, that tetraethyl lead, anti-knock chemical, is in a class by itself in raising ignition temperatures of oil.

Science News Letter, April 21, 1951

NUTRITION

Gather Wild Greens for Vitamin-Packed Salad

► **GATHER WILD** greens while your garden grows and fresh vegetables in market are still fairly costly. Like cultivated greens, the wild ones growing along roadsides and even sometimes on the front lawn furnish both vitamins and minerals as well as the appetite appeal of new and often tangy flavor.

First of the wild greens to come are dandelions. Also available at this season, and in fact at all seasons since it is an evergreen, is watercress. Check with your local health department about its safety, however, as in some localities the water it grows in might be polluted.

Besides these two greens, housewives may be able to serve, as a change from spinach and lettuce, stinging nettle, marsh marigold, dock, milkweed, chicory, wild onion, lamb's quarter, summer mustard, pokeweed, sorrel and purslane or pursley.

All members of the wild carrot family should be avoided. This includes Queen Anne's lace and other related plants with dissected, leafy foliage, having white or yellow umbrella-like flowering and possessing a strong odor when crushed. Stems and leaves of plants with woody stems should also be avoided.

Only the tender young leaves of plants should be selected for eating. By the time

the plants are in flower their flavor will be too strong. The greens, like those you buy at the market, should be thoroughly washed and all imperfect parts discarded. Young crisp leaves are nice for salad, but these wild greens can also be cooked and served like spinach or chard and served with butter or a sauce.

Science News Letter, April 21, 1951

BOTANY

Top New U. S. Marigold Is Available to Readers

► **NEW THREE-INCH** marigold blossoms, fully double and chrysanthemum-like, bring refreshing color to the garden. Seed of this Glitters marigold, an All-America flower winner for 1951, can now be obtained from SCIENCE SERVICE.

Close relative of the new Glitters marigold is Limelight, an All-America selection in 1940. A good trick is to plant in your garden several rows of the smaller but lovely Limelight marigold in front of the Glitters, which grow 30 to 50 inches tall. When they bloom, you will undoubtedly be pleased with both.

No one variety is best everywhere and no one variety, no matter how good, is best liked by all gardeners. So each gardener must try the new, but play safe with the tried and true, in finding what suits him best.

Corn, tomato, onion, squash and cucumbers are the only hybrid vegetables produced commercially in the United States today. Scientists have licked the problem of producing some hybrid seeds, but those of tomato and cucumber must still be produced by laborious hand-pollination. Only limited quantities are available, but they offer a higher yield.

Seeds of the Glitters and Limelight marigolds, and of two cucumber varieties, one an old stand-by and the other a good hybrid, have been collected for you by SCIENCE SERVICE, available for the nominal sum of 50 cents, in the current unit of monthly "THINGS of science" service. Grow them yourself to see whether you prefer the old or the new. Just write SCIENCE SERVICE, 1719 N St., N. W., Washington 6, D. C., and ask for the 1951 seeds kit.

Science News Letter, April 21, 1951

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ALL AROUND YOU: A First Look at the World—Jeanne Bendick—McGraw-Hill, 48 p., illus., \$2.00. A first science book for small children.

AMPHIBIANS AND REPTILES OF THE HOPKINS-BRANNER EXPEDITION TO BRAZIL—Karl P. Schmidt and Robert F. Inger—Chicago Natural History Museum, 27 p., paper, 40 cents.

COOPERATION AMONG ANIMALS WITH HUMAN IMPLICATIONS—W. C. Allee—Schuman, 233 p., illus., \$3.50. "Man," the author concludes, "is not bound to wait for a reshuffling of hereditary genes before he can discontinue behavior that tends toward the destruction of his species."

CULTURE WORLDS—Richard Joel Russell and Fred Bowerman Kniffer—Macmillan, 620 p., illus., \$6.00. A regional geography for college freshmen based on cultural divisions rather than on political frontiers.

FACTORS AFFECTING TEMPERATURES IN SOUTHERN FARMHOUSES—Joseph W. Simons and Frank B. Lanham—Govt. Printing Office, 91 p., illus., paper, 25 cents. Suggestions for keeping your house warm in winter and cool in summer. Technical Bulletin 822, USDA.

THE FOURIER INTEGRAL AND CERTAIN OF ITS APPLICATIONS—Norbert Wiener—Dover, 201 p., \$3.95. A book on advanced mathematics based on lectures given at the University of Cambridge, England. This is the first American printing of the book originally published in 1933.

GENERAL CHEMISTRY FOR COLLEGES—B. Smith Hopkins and John C. Bailar, Jr.—Heath, 4th ed., 694 p., illus., \$5.50. A text designed to give not only an understanding of the principles of chemistry but an appreciation of its importance in modern life.

HOP, SKIP, AND FLY: Stories of Small Creatures—Irmengarde Eberle—Holiday House, 62 p., illus., \$2.00. Charming nature stories for children of all ages.

I TOOK IT LYING DOWN—Marian Spitzer—Random House, 247 p., \$2.75. A recovered tuberculosis patient tells of her battle with that dread disease and the abrupt change from a life of hyperactivity to complete rest in bed.

INSECTS IN YOUR LIFE—C. H. Curran—Sheridan House, 316 p., illus., \$3.50. Interesting little tales about familiar creatures.

MAIL BY RAIL: The Story of the Postal Transportation Service—Bryant Alden Long and William Jefferson Dennis—Simmons-Boardman Publishing Corp., 414 p., illus., \$4.95. Telling the adventurous story of the Railway Mail Service with technical details of especial interest to those planning to enter the service.

A NEW LIZARD OF THE GENUS VARANUS FROM NEW GUINEA—Robert Mertens—Chicago Natural History Museum, 5 p., illus., paper, 10 cents.

THE ORIGIN OF THE EARTH—W. M. Smart—Cambridge, 239 p., illus., \$2.75. A book which had its origin in a series of lectures delivered to members of three fighting services during the last year of the Second World War.

PVP (POLYVINYLPIRROLIDONE): Preparation, Properties and Applications in the Blood Field and in Other Branches of Medicine. An Annotated Bibliography to 1950—General Aniline and Film Corp., 174 p., illus., free to research and medical directors upon request to the publishers, 230 Park Ave., New York 17, N. Y. Includes 227 abstracts on this synthetic blood plasma supplement.

PRACTICE FOR ARMY TESTS—Arco, 151 p., illus., paper, \$2.00. Material for practice of the general sort used in some of the Army tests. You will not improve your score tremendously by diligent study of this book, but it may help your confidence.

PROFESSIONAL OPPORTUNITIES IN MATHEMATICS—H. W. Brinkmann and others—Mathematical Association of America, 24 p., paper, 25 cents. Information for undergraduate students.

PSYCHOLOGICAL FACTORS OF PEACE AND WAR—T. H. Pear, Ed.—Philosophical Library, 262 p., \$4.75. In this book published on behalf of the United Nations Association, a group of psychologists have reported pertinent facts about the mental factors that lead to war or to peace.

A REVIEW OF THE WOODPECKERS CHRYSOPTILUS MELANOCHLOROS and C. MELANOLAIMUS—Melvin A. Traylor, Jr.—Chicago Natural History Museum, 17 p., illus., paper, 20 cents.

SOVIET ATOMIC ESPIONAGE—Joint Committee on Atomic Energy—Govt. Printing Office, 222 p., paper, 50 cents. Statements and hearings tending to link certain individuals with the transmission of information to Soviet Russia.

TWO NEW MAMMALS FROM SOUTHERN PERU—Colin Campbell Sanborn—Chicago Natural History Museum, 5 p., illus., paper, 10 cents. One is a new genus of marsupial and the other is a southern race of bat.

CHEMISTRY

Difficult to Rejuvenate Worn-out Storage Batteries

► VARIOUS PREPARATIONS advertised to put new life into worn-out or so-called "dead" lead-acid batteries, such as used in automobiles, have little or no value, it is shown from recent tests made by the National Bureau of Standards.

The Bureau has made extensive laboratory and field tests for the Federal Government in order to determine the practicability of these so-called additives. The tests show little or no difference between batteries treated with these mixtures and similar untreated batteries used as controls.

A circular describing the tests has just been issued by the Bureau. Copies may be obtained from the Government Printing Office for 15 cents. It is National Bureau of Standards Circular 504, entitled Battery Additives.

Science News Letter, April 21, 1951

Smog components responsible for damage to vegetation in the Los Angeles region are unsaturated hydrocarbons, main source of which is petroleum.

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❁ **FIRE ALARM** device for beds, to awaken a sleeper and the neighbors in case of fire from a lighted cigarette, is a recently patented affair which emits a series of explosive noises. It consists of a number of fire-cracker-like units on a main fuse running around the mattress.

Science News Letter, April 21, 1951

❁ **EARTHQUAKE INSTRUMENT** for the amateur, a relatively simple and low-priced seismograph, is suitable for routine observations as well as special research. It consists of a highly sensitive optical lever which records on photographic paper, and can be operated in a dark basement room.

Science News Letter, April 21, 1951

❁ **SEWING MACHINE** accessory enables the housewife to measure the tension on the thread and make necessary adjustments to obtain correct stitches. Held in position by suction cups with the thread extended into it, the device shows on a dial if the pull is too great or too little.

Science News Letter, April 21, 1951

❁ **MEDICAL STETHOSCOPE** is an electrical instrument, shown in the picture, that amplifies the sounds of the heart as picked



up by the doctor up to 50 times from normal stethoscopic intensity. Such conditions as murmurs, delayed beat and skipped beats are made much clearer and more audible.

Science News Letter, April 21, 1951

❁ **HUMIDITY CARD**, with seven circular color spots in a vertical column, indicates relative humidity from 10% to 70% by the color of the spots. They vary from white

to blue with changing moisture, the top blue one at any time showing the percentage of moisture in the air.

Science News Letter, April 21, 1951

❁ **HOUSEHOLD GLOVE**, British-made but now available in America, has a "sueded" inner lining, and a textured holding finger surface that makes slippery and soapy objects easy to handle. It is a latex glove, easy to put on or off without the use of powder, and comfortable to wear because of its curved fingers.

Science News Letter, April 21, 1951

❁ **SMOKE DETECTOR** for airliners, an improved type that can not give false alarms, is a small box-like affair on the pilot's instrument board through which air is drawn from the cargo compartment. Smoke in the air will reflect a light beam in the box, causing it to show in a window.

Science News Letter, April 21, 1951

❁ **HONEY REFRACTOMETER**, for use by the beekeeper or in a processing plant, determines in a few seconds the amount of water in the honey. Only a few drops of honey are required as a sample; direct readings to one-tenth of one percent of moisture can be obtained.

Science News Letter, April 21, 1951

Do You Know?

Sandy soils are improved by the addition of vegetable humus.

The highly-prized beaver is a rodent and a cousin of the rats and squirrels.

A teaspoonful of *saccharin* is equivalent to 375 teaspoons of sugar as a sweetening agent.

High-velocity cold-air tunnels, experimentally used to cool fruit rapidly before it is put in cold storage, condition fruit so that it can be held in storage for a longer period than otherwise.

Farm animals are helping farmers protect crops; turkeys kill worms in tobacco fields, goats control several kinds of shrubby weeds, and geese eat grass in the cotton field.

Enzymes are complex chemical substances, found particularly in the digestive juices of living creatures, that aid digestion by breaking down food molecules into simpler ones.

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